AMENDMENTS TO THE CLAIMS

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double-bracketed text indicating deletions.

LISTING OF CLAIMS

1. (CURRENTLY AMENDED) A colloidal cupric compound of formula (I):

$$CuA_xB_y \qquad (I)$$

wherein A and B are anions,

$0 \leq x \leq 2$,

$0 < y \leq 2$,

$mx + ny = 2$;

wherein m and n are coefficients equal to oxidation numbers of the anions A and B, respectively,

wherein the anion A is selected from the group consisting of Cl^-, Br^-, I^-, F^-, NO_3^- SO_4^{2-}, PO_4^{3-}, OH, $RCOO^-$, tartrate^{2-}, citrate^{3-} and ~~an~~ amino acid residues;

wherein R is selected from the group consisting of hydrogen, a C_1-C_{20} straight chain hydrocarbon, a C_1-C_{20} branched hydrocarbon and an aromatic group,

wherein the colloidal cupric compound made by a process comprising the steps of:

purifying a Cu^{2+} solution by adding an oxidizing agent and H_3PO_4 to the solution and purifying the solution, and

raising the pH of the solution, and

wherein the colloidal cupric compound does not fall out of the solution.

2. (ORIGINAL) The colloidal cupric compound of claim 1, wherein the Cu^{2+} solution is prepared from $CuSO_4 \cdot 5H_2O$.

3. (PREVIOUSLY PRESENTED) The colloidal cupric compound of claim 1, wherein said purifying step further includes the steps of:

adjusting the pH to 3;

heating the solution; and

removing the solids.

4. (PREVIOUSLY PRESENTED) The colloidal cupric compound of claim 1, wherein the oxidizing agent is selected from the group consisting of H_2O_2 and bleach.

5. (ORIGINAL) The colloidal cupric compound of claim 3, wherein adjusting the pH to 3 is performed by adding Na_2CO_3 solution.

6. (PREVIOUSLY PRESENTED) The colloidal cupric compound of claim 1, wherein the process further comprises:

adding an organic solvent to the solution to form a precipitate; and collecting the precipitate.

7. (PREVIOUSLY PRESENTED) The colloidal cupric compound of claim 6, wherein the organic solvent is selected from the group consisting of methanol and acetone.

8. (ORIGINAL) The colloidal cupric compound of claim 6, wherein the precipitate is dried by nitrogen flow.

9. (CURRENTLY AMENDED) A process for producing a colloidal cupric compound of formula (I):

$$CuA_xB_y \qquad (I)$$

wherein A and B are anions,

$0 \leq x \leq 2$,

$0 < y \leq 2$, and

$mx + ny = 2$;

wherein m and n are coefficients equal to oxidation numbers of the anion A and B, respectively,

wherein the anion A is selected from the group consisting of Cl^-, Br^-, I^-, F^-, NO_3^-, SO_4^{2-}, PO_4^{3-}, OH^-, $RCOO^-$, tartrate^{2-}, citrate^{3-} and ~~an~~ amino acid residues[[;]], and

wherein R is selected from the group consisting of hydrogen, a C_1-C_{20} straight chain hydrocarbon, a C_1-C_{20} branched hydrocarbon and an aromatic group;

the process comprising:

purifying a Cu^{2+} solution by adding an oxidizing agent and H_3PO_4 to the solution and purifying the solution, and

raising the pH of the solution.

10. (NOT ENTERED) The process of claim 9, wherein the Cu^{2+} solution is prepared from $CuSO_4 \cdot 5H_2O$.

11. (PREVIOUSLY PRESENTED) The process of claim 9, wherein said purifying step further includes the steps of:

adjusting the pH to 3;

heating the solution; and

removing the solids.

12. (PREVIOUSLY PRESENTED) The process of claim 9, wherein the oxidizing agent is selected from the group consisting of H_2O_2 and bleach.

13. (ORIGINAL) The process of claim 11, wherein adjusting the pH to 3 is performed by adding Na_2CO_3 solution.

14. (NOT ENTERED) The process of claim 9, wherein the process further comprises:

adding an organic solvent to the solution to form a precipitate; and collecting the precipitate.

15. (PREVIOUSLY PRESENTED) The process of claim 14, wherein the organic solvent is selected from the group consisting of methanol and acetone.

16. (ORIGINAL) The process of claim 14, further comprising drying the precipitate by nitrogen flow.

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17. (ORIGINAL) A method of controlling fungal diseases in plants comprising the step of applying to said plants a fungicide comprising the colloidal cupric compound of claim 1.

18. (CANCELED)

19. (ORIGINAL) The method of claim 17, wherein the fungicide is colloidal copper citrate.

20. (CANCELED)

21. (ORIGINAL) The method of claim 17, wherein the fungicide is colloidal copper citrate solution containing about 50 mg/L copper.

22. (CANCELED)

23. (PREVIOUSLY PRESENTED) A method of controlling fungal diseases in plants comprising the step of applying to said plants a fungicide made according to the process of claim 9.

24. (PREVIOUSLY PRESENTED) The method of claim 23, wherein the fungicide is colloidal copper citrate.

25. (PREVIOUSLY PRESENTED) The method of claim 23, wherein the fungicide is colloidal copper citrate solution containing about 50 mg/L copper.

26. (NEW) A method of forming a colloidally stable sol comprising:

forming an aqueous cupric solution;

purifying the aqueous cupric solution to produce a purified cupric solution substantially free of ions that can induce flocculation; and

introducing a sufficient quantity of at least one anion into the purified cupric solution to form a colloidally stable sol wherein water is the continuous phase and a cupric compound is the dispersed phase, and further wherein the colloidally stable sol is substantially free of stabilizing agents, the cupric compound corresponding to Formula I

$$Cu_zA_xB_y \qquad (I)$$

wherein A is an anion having an oxidation number m and x is an integer greater than 0;

B is an anion having an oxidation number n and y is an integer selected from a group consisting of 0 and integers greater than 0; and

the relationship $mx + ny = 2z$ is satisfied.

27. (NEW) A method of forming a colloidally stable sol according to claim 26, wherein:

forming the aqueous cupric solution includes dissolving a water-soluble cupric compound in water;

purifying the aqueous cupric solution includes forming and removing iron precipitates by

adding an oxidizer to the aqueous cupric solution to form an oxidized aqueous cupric solution,

acidifying the oxidized aqueous cupric solution to from an acidified aqueous cupric solution,

heating the acidified aqueous solution and maintaining the acidified aqueous cupric solution at an elevated temperature for a treatment period to form a treated aqueous cupric solution and iron precipitates,

filtering the treated aqueous cupric solution to remove the iron precipitates and obtain the purified aqueous cupric solution; and

increasing the pH of the purified aqueous cupric solution in the presence of the at least one anion to form the colloidally stable sol wherein the average particle size is less than about 1 μm.

28. (NEW) A method of forming a colloidally stable sol according to claim 27, wherein:

the water-soluble cupric compound is a cupric salt selected from a group consisting of $CuCl_2$ and $CuSO_4$;

the ions that can induce flocculation include at least one ion selected from a group consisting of Fe^{2+}, Fe^{3+} and Al^{3+};

the oxidizer is selected from a group consisting of H_2O_2, ozone, hypochlorites, bleach and H_3PO_4;

the elevated temperature is about 100 °C. and the treatment period is at least about 12 hours;

acidifying the aqueous cupric solution includes establishing a pH of about 3 in oxidized aqueous cupric solution,

increasing the pH of the purified aqueous cupric solution includes adding a sufficient quantity of a weak base to the purified aqueous cupric solution to achieve a pH of at least about 5 in the purified aqueous cupric solution.

29. (NEW) A method of forming a colloidally stable sol according to claim 28, wherein:

the weak base is selected from a group consisting of ammonia, sodium carbonate and sodium bicarbonate;

anion A is selected from a group consisting of OH^-, $tartrate^{2-}$, $citrate^{3-}$ and methionine residue; and

anion B is OH^-.

30. (NEW) A method of forming a colloidally stable sol according to claim 26, further comprising:

mixing the colloidally stable sol with a major portion of a water-miscible organic solvent to form a suspension of the cupric compound in a mixed solvent;

filtering the suspension to obtain a retentate including the cupric compound;

drying the retentate to remove the mixed solvent and obtain a dried cupric compound;

mixing the dried cupric compound with water to form a secondary colloidally stable sol.

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